

***In vitro* Effects of Selenium Supplementation on Adipose Tissue Growth and Development on Quail and Turkey**

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Selenium is an essential micronutrient that is required in normal functioning of the body. Selenium is not just important in the production of avian such as poultry. It is also important in the differentiation media for the differentiation of pre-adipocytes to adipocytes. Much of the primary research related to this subject has solely focused on poultry; however, it is unknown whether other production avian species exhibit similar results. The purpose of this project was to examine quail and turkey cells to determine if an increase in selenium concentration in pre-adipocyte differentiation media will increase the number of adipocytes present *in vitro*.

The experiment was conducted on varying amounts of embryos. Six-day old quails and eight-day old turkeys post-hatch will be humanely euthanized and adipose tissues will be collected and cultures will then be divided into four groups of three plates each for different selenium concentration treatments. The first group will not receive any selenium, the second group will receive the standard concentration of selenium, the third group will receive two times the standard concentration, and the fourth group will receive three times the standard concentration. Four days after the differentiation media is added to the cultures lipid droplet staining will be completed using Oil Red O staining according to the procedure. ATGL, SCD1, PPAR α , FABP4, and SeBP1 will also be determined by western blot and quantitative real-time PCR as described below.

Results are still ongoing and are not conclusive. However preliminary results have shown that increased selenium supplementation increase lipid accumulation but excess selenium causes some cell death due to toxicity. So far the data shows a correlation between selenium and increased lipid accumulation related to potentially increasing pre-adipocytes to adipocytes. Studies indicate that Se may cause an increase in glucose transport and decrease lipolysis, which would help in the understanding of diabetes.